

Table S1. The 48 synthetic units used to generate the library.

<i>Proximal units</i>					
Name ¹	5'left	Duplex Sequence ²	5'right	Length	Reference ³
ara1	Tt	cgtggtccatattgcatcagacattgtacccaac	ggatc	34	*
ara2	Tt	cgtgcatagcatttttatccatacgttacccaac	ggatc	34	*
con0	Tt	cgtgcaattttttaaaattaaaggcggttacccaac	ggatc	34	(Crooks et al, 2004)
con1	Tt	gaatacatctggcgggtgataaggcggttacccaac	ggatc	34	(Basu et al, 2004)
con2	Tt	gaatacctctggcgggtgataaggcggttacccaac	ggatc	34	(Basu et al, 2004)
con3	Tt	cgtgcaattttttatataccgccagggggtacaac	ggatc	34	(Hochschild and Ptashne, 1986)
con4	Tt	cgttatcaccgccaggggtaaggcggttacccaac	ggatc	34	(Hochschild and Ptashne, 1986)
lac1	Tt	tgtggaattgtgagcggataacaatttcacacag	ggatc	34	(Lanzer and Bujard, 1988)
lac2	Tt	agattcaattgtgagcggataacaatttcacaca	ggatc	34	(Lanzer and Bujard, 1988)
lac3	Tt	gattcaattgtgagcggataacaatttcacacag	ggatc	34	(Lutz and Bujard, 1997)
lac4	Tt	cgtgcaattttaaatgtgagcggataacaaccaac	ggatc	34	(Becker et al, 2005)
lux1	Tt	cgtgcaattttttaaacctgtaggatcgtacaggt	ggatc	34	(Egland and Greenberg, 2000)
lux2	Tt	cttgcgacaaacaataggtaaggcggttacccaac	ggatc	34	*
lux3	Tt	cctgtaggatcgtacaggttaaggcggttacccaac	ggatc	34	*
tet1	Tt	ccacccttatcagtgatagagcggttacccaac	ggatc	34	(Sizemore et al, 1990)
tet2 ⁴	Tt	aactctatcaatgaTAGAGTgtcaacaaaaaac	ggatc	34	(Sizemore et al, 1990)
<i>Core units</i>					
Name ¹	5'left	Duplex Sequence ²	5'right	Length	Reference ³
ara1 ⁴	C	AatcaatgTGGATTtctGATAC	Aa	23	(Hamilton and Lee, 1988)
ara2	C	AtagcggatacttctctgaTATAA	Aa	23	*
con0	C	AtttatgcttccggctcgTATAA	Aa	23	(Crooks et al, 2004)
con1	C	AtaaaataccactggcgggtGATAC	Aa	23	(Ptashne, 2004)
con2	C	TattttacctctggcgggtGATAA	Aa	23	(Ptashne, 2004)
con3	C	TtttatcccttgcggtgaTATAA	Aa	23	(Michalowski et al, 2004)
con4	C	AtttatcccttgcggtgaTAGAT	Aa	23	(Michalowski et al, 2004)
lac1	C	AttgtgagcggataacaaGATAC	Aa	23	(Lutz and Bujard, 1997)
lac2	C	TtgtgagcggataacaatGATAC	Aa	23	(Lanzer and Bujard, 1988)
lac3	C	TtgtgagcggataacaatTATAA	Aa	23	(Lanzer and Bujard, 1988)
lac4	C	TtgtgagcgctcacaattTATAA	Aa	23	(Lanzer and Bujard, 1988)
lux1	C	CctgtaggatcgtacaggTATAA	Aa	23	*
lux2 ⁵	C	AcctgtaggatcgtacaggTATAA	Aa	24	(Egland and Greenberg, 2000)
tet1	C	AtccctatcagtgatagaGATAC	Aa	23	(Lutz and Bujard, 1997)
tet2	C	AaataactctatcaatgaTAGAG	Aa	23	(Sizemore et al, 1990)
tet3 ⁵	C	ActctatcattgatagagtTATTT	Aa	24	(Sizemore et al, 1990)

1 The labels “tet”, “lac”, “ara”, and “lux” refer to TetR, LacI, AraC, and LuxR operators, respectively. The units named con1–con4 contain λ cl operators, and the units named con0 contain the consensus sequence with no operators.

2 The -10 and -35 boxes are capitalized. Approximate binding site locations are colored (TetR: blue, LuxR: cyan, LacI: green, AraC: magenta, cl: brown). 5' overhangs are shown for both the left and right sides of the duplex, cloning sites are highlighted in red.

3 A (*) refers to units designed for this study.

4 This unit contains an internal -10 box, capitalized.

5 This core unit has 1 bp extra space between -10 and -35 boxes.

<i>Distal units</i>					
Name ¹	5'left	Duplex Sequence ²	5'right	Length	Reference ³
ara1	tcgag	aa catagc atTTTT atccata agattagcggatctaaccTTTA	G	43	(Lutz and Bujard, 1997)
ara2	tcgag	tacaacgtcgtgtagctgccttt tagca atTTTT atcca TAGA	G	43	(Zhanget al, 1996)
ara3 ⁶	tcgag	gtaacaaaagt gtctataatcacggc agaaaagtc caca TTGA	G	43	(Hamilton and Lee, 1988)
con0	tcgag	tacaacgtcgtgtagctgcctttcgtcttcaataattcTTGA	G	43	(Crooks et al, 2004)
con1	tcgag	cagataaccatctgcggtgataaattatctcttggcggtgTTGA	G	43	(Lanzer and Bujard, 1988)
con2	tcgag	tatcacccagaggtaaaatagtc aacacgcacggtgt TAGG	G	43	(Ptashne, 2004)
con3	tcgag	tatcacccagaggtaaaatagtc aacacgcacggtgt TAGA	G	43	(Ptashne, 2004)
con4	tcgag	tacaacgtcgtgtagctgt tatcacccagaggt aagaTTGA	G	43	(Hochschild and Ptashne, 1986)
lac1	tcgag	tacaacgtcgtgtagctgcaattgtgagcggata aaca TTGA	G	43	(Lutz and Bujard, 1997)
lac2	tcgag	tacaacgtcgtgttaaattgtgagcggata aaca atttagTTGA	G	43	(Lanzer and Bujard, 1988)
lac3	tcgag	tacaattgtgagc gctcaca atttcgtcttcaataattcTTGA	G	43	(Becker et al, 2005)
lux1	tcgag	tacaattgtttaacataagt acctgtaggatcgtacagg TTTA	G	43	(Egland and Greenberg, 1999)
lux2	tcgag	tacaattgtttaacataagt gaatggatcattttgcagg TTTA	G	43	(Shadel and Baldwin, 1992)
lux3 ⁶	tcgag	acatagc atTTTT atccata acctgtaggatcgtacaggTTTA	G	43	*
tet1	tcgag	tacaacgtcgtgtagctgctccctatcagtgatagagaTTGA	G	43	(Lutz and Bujard, 1997)
tet2 ⁷	tcgag	tacaacgtCatttc acttTTCTCT atcactgataggagTGGT	G	43	(Sizemore et al, 1990)

6 This unit contains a non-functional AraC site.

7 This unit contains an internal -35 box, capitalized.